Hereditary hemochromatosis

Description

Hereditary hemochromatosis is a disorder that causes the body to absorb too much iron from the diet. The excess iron is stored in the body's tissues and organs, particularly the skin, heart, liver, pancreas, and joints. Because humans cannot increase the excretion of iron, excess iron can overload and eventually damage tissues and organs. For this reason, hereditary hemochromatosis is also called an iron overload disorder.

Early symptoms of hereditary hemochromatosis may include extreme tiredness (fatigue), joint pain, abdominal pain, weight loss, and loss of sex drive. As the condition worsens, affected individuals may develop arthritis, liver disease (cirrhosis) or liver cancer, diabetes, heart abnormalities, or skin discoloration. The appearance and severity of symptoms can be affected by environmental and lifestyle factors such as the amount of iron in the diet, alcohol use, and infections.

There are four types of hereditary hemochromatosis, which are classified depending on the age of onset and other factors such as genetic cause and mode of inheritance.

Type 1, the most common form of the disorder, and type 4 (also called ferroportin disease) begin in adulthood. Men with type 1 or type 4 hemochromatosis typically develop symptoms between the ages of 40 and 60, and women usually develop symptoms after menopause.

Type 2 hemochromatosis is known as a juvenile-onset disorder because symptoms often begin in childhood. By age 20, iron accumulation causes decreased or absent secretion of sex hormones. Affected females usually begin menstruation normally but menses stop after a few years. Males may experience delayed puberty or symptoms related to a shortage of sex hormones. If type 2 hemochromatosis is untreated, potentially fatal heart disease becomes evident by age 30.

The onset of type 3 hemochromatosis is usually intermediate between types 1 and 2 with symptoms generally beginning before age 30.

Frequency

Type 1 hemochromatosis is one of the most common genetic disorders in the United States, affecting about 1 million people. It most often affects people of Northern European descent. The other types of hemochromatosis are considered rare and have

been studied in only a small number of families worldwide.

Causes

Mutations in several genes can cause hereditary hemochromatosis. Type 1 hemochromatosis results from mutations in the *HFE* gene, and type 2 hemochromatosis results from mutations in either the *HJV* or *HAMP* gene. Mutations in the *TFR2* gene cause type 3 hemochromatosis, and mutations in the *SLC40A1* gene cause type 4 hemochromatosis.

The proteins produced from these genes play important roles in regulating the absorption, transport, and storage of iron in the body. Mutations in any of these genes impair the control of the intestine's absorption of iron from foods during digestion and alter the distribution of iron to other parts of the body. As a result, iron accumulates in tissues and organs, which can disrupt their normal functions.

Learn more about the genes associated with Hereditary hemochromatosis

- HAMP
- HFE
- HJV
- SLC40A1
- TFR2

Inheritance

Types 1, 2, and 3 hemochromatosis are inherited in an autosomal recessive pattern, which means both copies of the gene in each cell have mutations. Most often, the parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene but do not show signs and symptoms of the condition.

Type 4 hemochromatosis is distinguished by its autosomal dominant inheritance pattern. With this type of inheritance, one copy of the altered gene in each cell is sufficient to cause the disorder. In most cases, an affected person has one parent with the condition.

Other Names for This Condition

- Bronze diabetes
- Bronzed cirrhosis
- Familial hemochromatosis
- Genetic hemochromatosis
- Haemochromatosis
- HC

- Hemochromatosis
- Hereditary haemochromatosis
- HH
- HLAH
- Iron storage disorder
- Pigmentary cirrhosis
- Primary hemochromatosis
- Troisier-Hanot-Chauffard syndrome
- Von Recklenhausen-Applebaum disease

Additional Information & Resources

Genetic Testing Information

- Genetic Testing Registry: Hereditary hemochromatosis (https://www.ncbi.nlm.nih.gov/gtr/conditions/C0392514/)

Genetic and Rare Diseases Information Center

- Hemochromatosis (https://rarediseases.info.nih.gov/diseases/10746/index)
- Hemochromatosis type 2 (https://rarediseases.info.nih.gov/diseases/10092/index)
- Hemochromatosis type 3 (https://rarediseases.info.nih.gov/diseases/10093/index)
- Hemochromatosis type 4 (https://rarediseases.info.nih.gov/diseases/10094/index)
- Symptomatic form of hemochromatosis type 1 (https://rarediseases.info.nih.gov/diseases/10417/index)

Patient Support and Advocacy Resources

- National Organization for Rare Disorders (NORD) (https://rarediseases.org/)

Clinical Trials

- ClinicalTrials.gov (https://clinicaltrials.gov/search?cond=%22Hereditary hemochromatosis%22)

Catalog of Genes and Diseases from OMIM

- HEMOCHROMATOSIS, TYPE 1; HFE1 (https://omim.org/entry/235200)
- HEMOCHROMATOSIS, TYPE 3; HFE3 (https://omim.org/entry/604250)
- HEMOCHROMATOSIS, TYPE 2A; HFE2A (https://omim.org/entry/602390)

- HEMOCHROMATOSIS, TYPE 4; HFE4 (https://omim.org/entry/606069)
- HEMOCHROMATOSIS, TYPE 2B; HFE2B (https://omim.org/entry/613313)

Scientific Articles on PubMed

- PubMed (https://pubmed.ncbi.nlm.nih.gov/?term=%28Hemochromatosis%5BMAJR%5D%29+AND+%28%28hemochromatosis%5BTI%5D%29+OR+%28haemochromatosis%5BTI%5D%29%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+720+days%22%5Bdp%5D)

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